U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE
SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS

HEARING CHARTER

Homeland Security Research and Development at the EPA: Taking Stock and Looking Ahead

Wednesday, May 19, 2004
2:00 p.m. to 4:00 p.m.
2318 Rayburn House Office Building

1. Purpose:

On Wednesday, May 19, 2004 at 2:00 p.m., the Subcommittee on Environment, Technology, and Standards of the House Science Committee will hold a hearing on the homeland security research and development activities of the Environmental Protection Agency (EPA).

The hearing will focus specifically on two EPA research programs: one focused on improving the security of the nation's critical water infrastructure and the other one focused on methods to decontaminate buildings that have been exposed to chemical or biological agents (such as anthrax and ricin). Both programs are housed in EPA's Homeland Security Research Center (HSRC), which EPA established in 2002 and plans to discontinue at the end of Fiscal Year 2005 (FY 05).

The Subcommittee wants to better understand how these programs are working, how they are coordinated with the Department of Homeland Security (DHS), and the rationale for the proposed budget cut to the building decontamination program. The National Academy of Sciences (NAS) recently reviewed these programs and was critical of, among other things, EPA's focus on short-term research needs to the exclusion of needed long-term research.

The hearing will address the following overarching questions:

- What is EPA's role in homeland security research and development?
- How does EPA set short- and long-term priorities and coordinate its building and water research with DHS and the private sector?
- What recommendations has the NAS made to EPA on its building and water security research, and how has EPA responded to those recommendations?

- Why does the Administration's FY 05 budget propose to eliminate funding for EPA's Safe Building Program? Who is expected to carry out this research in the future?

2. Witnesses:

- **Dr. Paul Gilman** is the Assistant Administrator for the Office of Research and Development at the U.S. EPA.

- **Dr. Penrose (Parney) C. Albright** is Assistant Secretary in the Science and Technology Directorate at the Department of Homeland Security (DHS).

- **Dr. Charles E. Kolb, Jr**., is the President and CEO of Aerodyne Research, Inc. He has served on a variety of NAS panels and was a member of the panel that reviewed EPA's Safe Buildings Research Program.

- **Dr. Gregory B. Baecher** is a Professor and Chairman of the Department of Civil and Environmental Engineering at the University of Maryland. He is a member of the NAS Water Science and Technology Board and the Board on Infrastructure and the Constructed Environment. He was a member of the NAS panel that reviewed EPA's Water Security Research program.

Brief Overview

- EPA's Roles and Responsibilities: EPA has long-standing statutory responsibilities for responding to emergencies involving releases of industrial chemicals and some radiological materials. Supplemented by recent Homeland Security legislation[1] and numerous Presidential Homeland Security Directives since 1995,[2] EPA has been assigned a variety of roles in detecting and responding to chemical, radiological, or biological threats to the water, air, buildings, and food and agricultural systems. For example, EPA has been named the lead agency for building decontamination, a responsibility which includes developing standards for when is it safe to reenter a building. The agency also has lead responsibility for water systems security, and plays a supporting role for agriculture and food security.

[1] The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188) directed EPA to undertake research and support vulnerability assessments for drinking water systems.
[2] Presidential Decision Directive (PDD) 39, *U.S. Policy on Counter Terrorism* (1995); PDD 62, *Protection Against Unconventional Threats to the Homeland and America Oversees* (1998); PDD 63 *Critical Infrastructure Protection* (1998); Homeland Security Presidential Directive (HSPD) 5, *Management of Domestic Incidents* (2003); HSPD 7, *Critical Infrastructure Identification, Prioritization and Protection* (2003); HSPD 9, *Defense of United States Agriculture and Food* (2004); HSPD 10, *National Biodefense Strategy* (2004).

- Creation of the Homeland Security Research Center: To respond to its growing homeland security research responsibilities, EPA consolidated its homeland security research programs into a Homeland Security Research Center (HSRC) in September, 2002.[3] HSRC's management and core staff operate out of Cincinnati, OH, although many other agency personnel are affiliated with the center. The goal of the HSRC was the rapid production of technical information, guidance and risk assessment tools to support the prevention, detection, containment, and decontamination of chemical and biological attacks against water systems and buildings. Much of the research is supported through extramural contracts. EPA originally planned the HSRC as a temporary organization that would be discontinued at the end of FY 05. The original rationale for establishing a temporary center was to avoid a protracted internal organizational fight that might occur if the HSRC was viewed as a permanent entity and to begin research as soon as possible. However, given longer-term research needs, EPA is now considering whether to extend the life of the HSRC.

- HSRC Organization: The HSRC is organized into three major program areas: (1) the Safe Buildings Program focuses on protection of building occupants in the event of contamination with chemical or biological agents and the various stages of building cleanup, which include detection, containment, decontamination, and disposal; (2) the Water Security Research Program focuses on preventing, detecting and responding to contaminants intentionally introduced into water supply, treatment, and distribution infrastructures; and (3) the Rapid Risk Assessment Program develops information systems, risk estimates, and risk communication tools for first responders and operators of buildings and water systems. The Center also supports five Environmental Technology Verification Centers (ETVs) that verify the performance of technologies that can be used to decontaminate and monitor environments in buildings and water systems.[4]

- DHS Roles and Responsibilities: DHS has overall responsibility for coordinating Federal homeland security R&D, including water security and building decontamination research. It coordinates with EPA through informal interactions and interagency working groups and carries out research intended to compliment the research that EPA carries out as the overall lead for building decontamination and water security. For example, DHS has focused its water security and building decontamination programmatic priorities on worst-case scenarios that could result in very large numbers of casualties (thousands, or tens of thousands), such as

[3] EPA also established several new offices and reorganized others. In addition to establishing the HSRC, EPA created an Office of Homeland Security in the Administrator's office to advise the Administrator and coordinate Agency-wide activities, and a new division for Water Security in the Office of Water. It also consolidated emergency response and preparedness functions in the Office of Solid Waste and Emergency Response to create an Office of Emergency Prevention, Preparedness and Response.

[4] These centers are run by a variety of organizations, including Batelle National laboratory and NSF International (formerly known as the National Sanitary Foundation, a voluntary standards-setting organization). To date, the five verification centers have reviewed or are reviewing more than 35 technologies in such areas as cyanide water detectors, rapid toxicity testing, chemical air detectors, air ventilation filters, and building decontamination technologies.

determining what and how biological or chemical agents could lead to high-casualty incidents. It also has focused on developing and testing protocols to improve overall system response in case of an event and on technologies for detection and decontamination where it has unique expertise.

- National Academy of Sciences Studies: In 2003, at EPA's request, the NAS convened two panels—one to review EPA's research agenda for its water security research program and the other to review the agenda for the Safe Buildings Program. Specifically, EPA asked the Academy to assess whether EPA's plans identified the most important research questions, and, if not, what research should be added. The agency also asked whether EPA's water security and building decontamination research was appropriately prioritized. Both reviews were completed in the fall of 2003. EPA has indicated that it waited for the NAS recommendations before obligating its FY 03 and FY 04 homeland security research funds.

- EPA Funding for the Homeland Security Research Center and the Proposed FY 05 Budget cut: Congress appropriated approximately $51 million in FY 03 for the HSRC and $27 million in FY 04. These figures include funding for the rapid risk assessment program, which supports both building and water security research. Building decontamination funds are transferred from the Agency's Superfund account (which traditionally funds cleanup of industrial chemical contamination), and water funds are provided from the agency's Science and Technology (S&T) account. The President's budget submission requests $22 million for the HSRC in FY 05, a $6 million (21 percent) reduction. While $2 million has been added for biodefense research, the FY 05 President budget proposes to eliminate funding for the building decontamination research program.[5]

HSRC Funding
(in millions)

	FY 03	FY 04	FY 05 Request
Water	$9.0	$10.5	$12.8
Buildings	$38.3	$8.2	$0.0
Rapid Risk Assessment	$4.0	$7.8	$7.5
Biodefense	$0.0	$0.0	$2.0
TOTAL	**$51.3**	**$26.5**	**$22.3**

[5] Congress also appropriated an additional $15 million in FY 03 and $25 million in FY 04 from the S&T account to EPA's Water Office for related water security research.

Key Issues

What did the NAS conclude about EPA's building and water security research plan?

The NAS created two panels - one to examine EPA's water security research plan and the other to review the Safe Buildings Program research plan. Although the panels were asked to answer the same questions, they approached their tasks differently. The panel that examined the building program looked more at the overall plan and focused on those areas in which EPA could make the most difference in the time before the HSRC closed its doors. The water security panel examined the details of the proposed research projects and made many specific recommendations for improving individual projects.

1. Safe Buildings Program

The NAS panel concluded that EPA correctly identified the major research areas essential for the Safe Buildings Program. However, it also found some important shortcomings that EPA should address. According to the panel, because the research plan contained too many short-term projects that could not be completed within the three-year life of the HSRC, EPA should narrow its research to those priority areas that could be completed within the three-year life of the center. The panel specifically recommended that EPA:

- focus on decontamination and disposal research, and support research on detection and containment only to the extent that they support research on decontamination and disposal;
- place special emphasis on the development of building decontamination standards that would help determine "how clean is safe;" and
- do a better job of setting priorities and use threat scenarios to guide its priorities.

2. Water Security Research

The NAS panel made nearly 100 specific recommendations to strengthen EPA's water security research plan. According to the panel:

- EPA's water security research plan included more research than the agency could carry out in three years;
- the plan should clearly identify short-, medium- and long-term research needs;
- the plan should identify funding levels required to the perform the indicated research;
- the plan should establish an overarching framework to describe how the individual research projects contribute to improved water security;
- research is needed on the costs and benefits of water security measures; and
- the agency must more rapidly disseminate its research findings to water utility officials.

Why does the administration propose to eliminate EPA's safe buildings program in its FY 05 budget request and who will carry out this research in the future if the program is cut?

EPA's Congressional budget justification for its FY 05 request indicates that the proposed $8.2 million budget decrease represents the complete elimination of homeland security building decontamination research, but offers no rationale for eliminating the program and does not explain whether this work will be carried out by other agencies in the future. At a February 2004 Science Committee hearing on the President's FY 05 budget request for civilian science agencies, Dr. Charles McQueary, DHS Under Secretary for Science and Technology, expressed the view that building decontamination research is a critically important component of homeland security research, but he was not familiar with why the program at EPA was cut, or if any other agency was expected to take over these functions. At a March 2004 Environment, Technology, and Standards Subcommittee hearing on EPA's FY 05 budget request, Clayton Johnson III, Deputy Director for Management at the Office of Management and Budget, explained that EPA did not need the funds for its building decontamination research program in FY 05 because the agency had not yet obligated its FY 03 funds. According to EPA, however, the agency delayed obligating FY 03 funds because it received its FY 03 funds very late in the fiscal year, and was awaiting the results of the two NAS studies and other input before deciding where to invest the funds. All EPA FY 03 budgeted building decontamination research funds have since been obligated.

What high-priority research will not begin or be completed if funds are not available for EPA's safe buildings program in FY 05?

The proposed elimination of funding for the Safe Buildings Program would halt many ongoing high-priority research projects and prevent the start of others, according to EPA. (See Attachment A for a comprehensive list of EPA programs that would be terminated or otherwise delayed due to the proposed FY 05 budget cut). Among projects that would not be completed are field-tests of a sampling and analysis protocol for anthrax, an indoor air human exposure model for chemical and biological contaminants, and guidance on methods for using a building's air handling systems to mitigate and contain contamination. EPA would also be unable to evaluate a range of emerging decontamination methods, and would limit its analysis of methods for biological decontamination almost exclusively to anthrax

Are there homeland security threats related to EPA responsibilities that EPA and DHS R&D programs are not addressing?

Although EPA's responsibilities for building decontamination and water system security are now formalized, there are still situations where authority and responsibility remain undefined. For example, according to DHS, it is not clear that any Federal agency has lead responsibility for research on detection, response, and decontamination of an open

space in a populated area such as the National Mall in Washington, DC. Any remaining gaps should be identified and prioritized relative to other research needs.

Research gaps may take other forms as well. According to many experts, the success of any response to a chemical, biological or radiological attack will also depend on more than clear formal lines of responsibility. The response to a real attack will involve a complex mix of skills of federal, state and local agencies that have little experience operating together and are not familiar with each others protocols or standards. Additional interagency agreements and more field tests of response protocols may be required to ensure that we are as prepared as possible for a real event.

Witness Questions

Dr. Gilman:

- Please describe the Environmental Protection Agency's (EPA's) role in homeland security research and development (R&D) in general, and provide specific details on the agency's homeland security efforts in water and building R&D.

- What are EPA's short- and long-term research plans in these areas? Are there any critical research areas not included in these plans? If so, why? How does EPA set its research priorities and coordinate with the Department of Homeland Security and the private sector?

- What specific steps has EPA taken to implement the National Academy of Sciences' recommendations on the agency's water and building homeland security R&D agendas? Does the agency agree with all the recommendations? If not, please provide examples and explain why.

- Why did the Administration's FY 05 budget request for EPA eliminate funding for the homeland security building research program? What specific projects and research will not be funded because of the budget request? Has EPA identified another entity to conduct the research, or will EPA request funding in FY 06 to conduct the work?

Dr. Albright:

- Please describe the Environmental Protection Agency's (EPA's) and the Department of Homeland Security's (DHS's) roles in homeland security research and development (R&D) for water systems and buildings? In which areas of homeland security R&D does EPA have the lead role for the Federal government, and in which areas does it have a supporting role?

- Are there additional R&D needs for building and water security in either the short- or long-term? If so, is this R&D that EPA should be doing?

- Has EPA incorporated the input of DHS and the private sector into its R&D agenda? How has DHS incorporated the input of EPA into its R&D planning? Do EPA and DHS jointly fund or implement projects or programs? If so, please provide examples.

- Given the Administration's proposal to eliminate homeland security building research at EPA, how will the federal government ensure that this research is carried out in fiscal year 2005? Who will be responsible for this research?

Dr. Kolb:

- Please outline the key findings and recommendations of the National Academy of Sciences' report, *A Review of Homeland Security Efforts: Safe Building Program Research Implementation Plan.*

- Is there sufficient collaboration among Environmental Protection Agency (EPA), the Department of Homeland Security (DHS) and other interests to ensure that EPA is properly focusing its research agenda? If not, what steps should EPA and DHS take to improve this collaboration?

Dr. Baecher:

- Please outline the key findings and recommendations of the National Academy of Sciences' report, *A Review of the EPA Water Security Research and Technical Support Plan (Part 1 & 2).*

- Is there sufficient collaboration among Environmental Protection Agency (EPA), the Department of Homeland Security (DHS) and other interests to ensure that EPA is properly focusing its research agenda? If not, what steps should EPA and DHS take to improve this collaboration?

Attachment A

According to EPA, the following projects would be eliminated due to the proposed FY 05 budget cuts:

- EPA will complete development and bench scale validation of an approved sampling and analysis protocol for anthrax. However, it would not field validate the method or develop methods for 10 additional biological agents.

- EPA has completed an evaluation of the effectiveness of residential safe havens (duct tape and plastic). However, it would not complete an evaluation for non-residential safe havens (e.g., work environment). These involve considerably more complex approaches.

- EPA has completed development of a building indoor air exposure model to estimate human exposure to chemical and biological contaminants from an attack. However, the model would not be field validated.

- EPA will provide interim guidance on the design and operation of existing building decontamination methods. However, it would be unable to evaluate a range of emerging decontamination methods nor conduct field validation of existing methods and provide final guidance. Also, methods for biological decontamination would be limited almost exclusively to anthrax.

- EPA will complete threat assessment and exposure simulations for the highest consequence building attack scenarios. However, other scenarios would not be addressed.

- EPA will complete interim guidance on methods for using building air handling systems to mitigate and contain contamination from chemical and biological attacks. However, it would not complete field verification and a complete analysis of the consequences of external (ambient) attacks.

- EPA will complete ETV commercial technology performance verifications for 2 chemical-in-air detectors, 10 ventilation air filters and 3 building decontamination technologies. It would not be able to continue the evaluation of building air filters in FY 04 and FY 05 and would terminate the air detector verifications after FY 04.

- EPA will complete interim guidance on disposal technologies for decontamination waste and residuals. However, field evaluation of contaminant transport and fate in landfills and landfill gases would not be possible, preventing completion of final guidance.

- EPA will complete laboratory evaluation of improved sterilant efficacy testing methods for pesticide crisis exemptions. Field verifications would not be completed.

- EPA will evaluate the requirements that would need to be met by existing sensors to assure adequate performance for decontamination. However, it would not evaluate new sensor technologies.

- EPA also would not complete:
    - adaptation of existing LASER and infrared sensors for building protection and decontamination
    - case studies and design guidance for retrofitting building protection systems into existing structures
    - research on the impact of building environmental conditions and human activities on the dispersal and exposure contact to chemical and biological agents
    - research on contaminant infiltration through building shells and dispersion of heavier-than-air gasses.